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ABSTRACT

Examined was the feasibility of using the achievement of 29 educable retarded 10- to 12-year-old students to measure teaching effectiveness of 12 special education teacher trainees, and investigated was the relationship of trainee characteristics, classroom process, and educable retarded pupil learning. The Individual Cognitive Demand Schedule and the Indiana Behavior Management Scale were used to record process variables during each 30-minute instructional period, and pupils were administered achievement tests covering the lesson's content area. Results of the study indicated that: the method developed was feasible; some generalizability of teaching ability existed across the content areas; there were differences between the beginning and student teacher groups in teaching methods and pupil achievement; almost no stable relationships between trainee characteristics and teaching ability were found; and although few consistent relationships between pupil learning and process variables were found, the group that obtained higher pupil achievement scores (beginning trainees) tended to use more informational and negative feedback and less positive feedback than did the group that obtained lower scores (student teacher trainees). (Author/CL)

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THE RELATIONSHIP OF TEACHER-TRAINEE CHARACTERISTICS, CLASSROOM PROCESS VARIABLES, AND EMR PUPIL LEARNING TO SPECIAL EDUCATION TEACHER-TRAINEES' TEACHING ABILITY[1]

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Abstract

This pilot study was designed to test the feasibility of using a performance test method in assessing the teaching ability of prospective special education teachers by utilizing educable mentally retarded pupil achievement as an indication of teacher effectiveness. It also examined the relationship of trainee characteristics, classroom process variables, and EMR pupil learning.

Subjects included: 29 EMR children (CA 10-12, IQ 56-79), who volunteered to participate in the study and who received remuneration for each day of their participation; and 33 Indiana University students involved in special education courses (11 beginning students, 12 pre-students teachers, and 10 student teachers). All completed the personnel inventory (which included the California Test of Personality, the Quick Word Test, Connotative Reaction Inventory, a mental retardation content exam, and the Teacher Practices Questionnaire). Twelve of these trainees were randomly selected to teach in the study, six beginning and six student teacher trainees.

The 12 trainees each conducted two 30-minute lessons, one from each

of two content areas, musical notation and concept-formation. The objectives of the lesson were specified but the teaching method was not. Each lesson was distributed one day prior to the teaching session, and order of content lesson and time of teaching were balanced across the study. For each class period, six children, from the overall group of 29, were reassigned to be pupils in one of the two classrooms. Upon completion of the lesson, each child completed an achievement test covering the lesson's objectives.

Two observation systems were employed to record process variables during the teaching session: The Individual Cognitive Demand Schedule (cognitive level of questions initiated by the teacher) and the Indiana Behavior Management Scale.

Results of the study indicated that: (a) the method developed was feasible; (b) some generalizability of teaching ability existed across the content areas; (c) there were differences between the beginning and student teacher groups in teaching methods and pupil achievement; (d) almost no stable relationships between trainee characteristics and teaching ability were found; (e) although few consistent relationships between pupil learning and process variables were found, the group that obtained higher pupil achievement scores (beginning trainees) tended to use more informational and negative feedback and less positive feedback than did the group that obtained lower scores (student teacher trainees).

A full scale replicate of this study is needed. It should in-

clude extensive materials develcpment, a larger number of trainees, and control--or at least measurement--of the important teaching variable of trainee motivation. The latter was uncontrolled in the present study and could account for some of the trends in the data.

THE RELATIONSHIP OF TEACHER-TRAINEE CHARACTERISTICS, CLASSROOM PROCESS VARIABLES, AND EMR PUPIL LEARNING TO SPECIAL EDUCATION TEACHER-TRAINEE'S TEACHING ABILITY[1]

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In conjunction with the current demand for accountability in educational programs, the number of students at all educational levels is remaining constant or diminishing. It is clear that fewer new teachers will be needed in the years to come and that teacher-training programs will exercise more selectivity in admitting new students.

This study assessed the feasibility of developing a performance task of teaching ability which utilized at least one measure accepted as an indication of accountability: amount of pupil achievement following a specific lesson. The measure task could be used to address the accountability issue; both on individual and training program levels, as an initial screening device for entry into teacher-training programs, and as a counseling tool to help students decide if they want to pursue a teaching career.

The teaching-ability measure involves two major assumptions. One of these has not been empirically validated, and the other rests mainly on opinion.

The latter assumption is that pupil learning is a relevant measure of teaching effectiveness; the former is that a generalized teaching ability exists. This implies that a person's teaching ability remains at

approximately the same level over time and across content areas unless he/she encounters relevent experiences to alter the ability. If this is true, a measure of teaching ability before entrance into a teacher-training program should give evidence of the candidate's potential success as a teacher. It also implies that for a training program to be considered successful, it must raise that ability in its trainees.

This pilot study developed a performance teaching-ability measure. It examined the relationship of trainee personality and ability variables to this measure. It attacked the question of generalized teaching ability by looking at the results from the performance teaching-ability measure for trainees teaching lessons from two different content areas. It also looked at the difference between trainees beginning and those finishing a teacher-training program in an attempt to examine the combined effects of maturation and the training program itself.

This project anticipated a larger longitudinal study utilizing the above method or a variation of it for measuring teaching ability. In order for such a method to be cost-effective, as well as valid, the complex procedures demanded by the investigation of variables at many levels have to be demonstrated as workable. The pilot process was deemed to be the most efficient method of uncovering methodological and procedural weaknesses and providing the experiential basis for the full-scale, longitudinal investigation.

Literature Review

The literature review for this study focused on issues relating to the measurement of teacher effectiveness including descriptions and analyses of predictor and criterion measures, controlled observations of teacher behavior, and analyses of pupil behavior changes.

Selection of Prospective Teachers and the Measurement of Their Effectiveness

The characterization of the "effective" or "successful" teacher has been and will continue to be the focus of a myriad of research in all areas of teacher education (Anderson & Hunka, 1963; Barr, Worcester, Abell, Beecher, Jensen, Peronto, Ringness, & Schmid 1961; Combs, 1965; Rosenshine, 1971; Ryans, 1960; and Turner & Fattu, 1960). It became increasingly evident in the early 1960's, however, that research into the evaluation and prediction of teaching proficiency using various criterion and predictor variables had reached an impasse. "Negligible relationships existed within and among the various criteria of teaching proficiency: the ultimate criterion of pupil growth along desired dimensions, the immediate criterion of practice teaching marks, and the intermediate criterion of principal's or superintendent's ratings [Thorndike, 1959, pp. 121-124]."

With specific reference to teachers of retarded children, there is no question but that a significant part of the growth and development of children in a classroom is a function of the personality of the teacher (Meisgeier, 1965), but it would appear futile to continue to search for teacher characteristics or educational backgrounds as the predictors of teaching success with any group of children (Biddle & Ellena, 1964; Bowers, Davis & Bowers, 1962; Jensen, 1961; Johnson, 1964; and Turner & Fattu, 1961).

Although support has existed for the notion that the ultimate criteria of teacher effectiveness must be a measure of the changes that take place in pupil behavior (Barr, Bechdolt, Gage, Orleans, Pace, Remmers, & Ryans, 1953; and Orleans, Clarke, Ostreicher, & Standlee, 1952), initial studies on teacher effectiveness using the criterion of pupil change were inconclusive and contradictory in that a variety of external factors were not controlled (i.e., content of lessons, experience level of teacher, teacher-pupil relationships, training of teachers) and in that it is difficult to define pupil growth or change operationally (Ackerman, 1954).

Of the research and development activities that emerged in teacher education in response to the above problems, two thrusts appear extremely useful for the assessment of teacher effectiveness in special education. The analysis of teacher behavior through controlled observations has yielded promising data in terms of descriptions and analyses of process variables (Anderson & Hunka, 1963; Fink & Semmel, 1971; Flanders & Simon, 1969; Lynch & Ames, 1971; and Ryans, 1960). In addition, the development of performance-based teacher education programs has underscored the need for having preservice teachers develop competencies which may be indirectly tested against pupil achievement (Elam, 1971; and Smith, 1971). By specifying the instructional objective or the teaching competency and then requiring the teacher to meet this objective or demonstrate the competency, the issue becomes one of determining the extent to which a teacher has demonstrated the skill to change pupil behavior in the required direction. This notion has received considerable support (Millman, 1971; Popham, 1971 (a);

Rosenshine & Furst, 1971; and Shalock, 1971).

Thus, the measurement of teacher effectiveness becomes operationally specific if its analysis includes an assessment of teacher characteristics, an analysis of process variables recorded during encounters with children, and measures of change in pupil behavior in accordance with prespecified objectives.

The Performance Test of Teaching Effectiveness

The performance test proposed in this study was an extension of the controlled teaching encounters used at the Stanford Center for Research and Development in Teaching and at the University of California at Los Angeles (Popham, 1971 (b); Popham, Millman & McNeil, 1972). Briefly, the teacher is given one or more explicit instructional objectives; she is given sufficient time to plan an instructional sequence; she instructs a group of learners; and, at the conclusion of the instruction, the learners are tested with respect to the objective.

To increase the validity of this procedure, Millman (1971) has suggested several precautionary steps, two of which were followed in the present study: the post-instructional measures were carefully constructed, and the students were assigned to a "teacher" on a random basis.

A study which provided the basis for the development of this measure for assessing general teaching ability was carried out by Justiz (1969). His subjects were 17 student teachers who had taken the Minnesota Teacher Attitude Inventory questionnaire to measure their attitudes towards pupils and teaching in general. Each student teacher instructed two randomly reconstructed high school classes (12 to 18 students per class) on two

successive encounters. Each lesson lasted 30 minutes. At the end of the lesson, the students were given a 15-minute posttest covering the lesson's objectives. Justiz' results indicated that: (a) the ability of student teachers to produce pupil achievement can be reliably measured; (b) a general teaching ability across content areas exists; and (c) there is a relationship between teacher attitudes and pupil achievement.

Several implications from the Justiz study were incorporated into the present study: (a) teacher performance differences are related to pupil learning; (b) class scores are minimally affected by pupil differences when pupil groups are chosen randomly; (c) teacher effectiveness may be assessed reliably in a short period of time; (d) stability of teacher effects upon student achievement can be demonstrated. An additional pilot study (Fargo, 1967), found after the completion of this project, utilized a similar methodology in exploring the effectiveness of teachers interacting with one child in a five-minute lesson.

Specifying Performance Criteria

There is a continuing need to develop and validate specific performance criteria for the objective assessment of teaching (Smith, 1971). The criteria developed and utilized in the present study were geared to the assessment of those teaching behaviors which could be tracked over time, so as to provide the best possible predictors of teaching success. This longitudinal data should partially resolve a research question that is raised continually (Rosenshine, 1971): Is a teacher who is effective or ineffective once, equally effective or ineffective a second time?

Objectives

The objectives of this study were: (a) to develop a workable performance measure of teaching ability for use specifically with special education teacher-trainees; (b) to explore the relationship between characteristics of teacher-trainees as measured by paper and pencil tests and the teaching ability of trainees as measured by pupil posttest scores; (c) to explore the relationship between pupil learning and level of cognitive questioning and techniques of behavior management used by the trainees during teaching; (d) to look at the question of generalized teaching ability by examining the mean pupil achievement scores, levels of questioning, and management techniques for each trainee across two different content areas; (e) to assess differences in teaching ability, management techniques, questioning levels, and personal characteristics between beginning and student teacher trainees; and (f) to assess differences in management techniques, questioning levels, and personal characteristics between groups of trainees whose classes scored high and low on the posttests.

Method

Subject

There were two groups of subjects in this study: (a) teacher-trainees who prepared lessons and taught small classes of pupils, and (b) intermediate-level EMR children who were taught by the teacher-trainees.

Teacher-trainees. Three groups of Indiana University students enrolled in special education courses (11 beginning students, 12 pre-student teachers and 10 student teachers) constituted the teacher-trainee sample. The beginning student sample consisted of students currently en-

rolled in the Introduction to Special Education course, the first course in Special Education; these students had not yet declared a major in Special Education. The pre-student teacher sample included students enrolled in one or more of the Special Education methods courses; they had completed between 9 and 12 hours of content courses in Special Education and were seeking major certification in this area. The student teacher sample consisted of students currently enrolled in one semester of student teaching who were completing the undergraduate program in Special Education. Students were randomly selected from their respective populations and were individually contacted and asked to volunteer for this study. Table 1 presents the refusal data from the subjects. The Personnel Inventory was administered to those students who volunteered. From an original group of 33 trainees, 12 (6 beginners and 6 student teachers) were selected for actual teaching participation in the study; the remainder were eliminated due to time and procedural constraints. The 12 trainees were selected on the basis of availability; they had to be available to teach the two lessons.

EMR children. The students taught were children from the EMR classes of the Monroe County schools. There were 29 children varying in age from 10 to 12 years old with an IQ range of 56-79. To obtain participation, letters were sent to the parents of all the intermediate-aged EMR children in Monroe County. The 29 affirmative responses were asked to come after school, they were paid $3.00 per day for their participation.

Materials

Several sets of materials were used in this study. A Personnel Inventory was developed to measure the trainee characteristics which research has shown to be pertinent to teaching ability. A set of lessons and tests in each of two content areas was developed for use by the trainees in the teaching situations. Two observation scales, one involving behavior management and the other involving level of cognitive questioning, were selected to record the actual teaching processes used by the trainees.

TABLE 1

Refusal Data for Subject Participation

Level of Student	Students Took Personnel Inventory/Students Contacted	Students Participated in Teaching/Students Contacted
Beginning	11 / 15	6 / 6
Pre-student teacher	12 / 25	---
Student teacher	10* / 36	6** / 10

* 6 / 10 agreed when first contacted; remaining four were convinced by staff to participate.

** 4 / 6 agreed when contacted; remaining two again were convinced by staff.

Personnel Inventory. A 2 1/2-hour basic personnel inventory was developed and administered to the three groups of trainees. It consisted of the following elements:

1. Biographical data sheet: This data sheet is an extended version of a form used in Project PRIME, an ongoing project at the Center for Innovation in Teaching the Handicapped. Normal demographic information (e.g., name, sex, G.P.A.) is obtained, as well as information that various research studies (Castricone, 1966; and Jones, 1966) have indicated may be important for teaching in special education, such as previous experience with mentally retarded children.

2. Personality measure: Several research studies (Durflinger, 1963; Garrison & Scott, 1961; Harring, 1969; and Jones, 1966) have indicated that personality characteristics affect the decision to go into teaching and the probability of success in teaching. The California Test of Personality was selected and administered to provide personality data.

3. Verbal ability: There is much evidence of a relationship between verbal ability and teaching success (United States Office of Education, 1971; Ryans, 1960). A short instrument measuring verbal ability, The Quick Word Test, (Borgatta & Corsini, 1968), was included in the Personnel Inventory.

4. Attitudes toward handicapped children: Evidence indicates that there are differences in attitudes toward handicapped children among various education majors (Semmel & Dickson, 1966) and among teachers of handicapped children (England & Semmel, 1969). To explore further this area of concern, the Connotative Reaction Inventory (Semmel & Dickson, 1966) was included to obtain an attitude measure. This instrument is scaled

to indicate rejection of various handicapping conditions in different social-psychological situations.

5. Information about mentally retarded children: To determine if differences in knowledge of mental retardation might be related to success in teaching EMR children, an instrument measuring such knowledge was constructed by an expert[2] in special education. The instrument consisted of 50 multiple-choice questions selected from a set of questions based on the content of The Mentally Retarded Child (Robinson & Robinson, 1965), a well-known textbook in the field.

6. Teacher role perceptions: This instrument was selected to obtain information concerning the trainee's perceptions of teacher role (Sorenson, Husek & Yu, 1963). It presents several situations involving teachers and pupils, each described in a paragraph. Following each situation, several courses of teacher action are presented. The trainee rates each action from "inappropriate" to "appropriate." The instrument is designed to characterize the trainee's perceptions of the role along the dimensions of advice-information giver, counselor, disciplinarian, referrer, and motivator.

Lessons. The lesson objectives were written for two different content areas. To test for generalizability of teaching ability across content areas, several sets of lessons and corresponding posttests were developed from the areas of music and concept-formation. Several intermediate-level EMR teachers indicated that musical notation is not a part of the normal school curriculum and hence the content of lessons based on this area would be unfamiliar to most EMR students.

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[2] Dr. Susan Shuster, Special Education Department, Indiana University.

The lessons developed were designed to teach the concepts of the five-line musical staff, octaves, time signature, and ascending and descending notes.

The concept-formation lessons were developed from a set of concept-formation materials developed at the Center for Innovation in Teaching the Handicapped (Thiagarajan, 1972). The materials are based on a set of imaginary figures called Monzers that can be organized into named classes and subclasses on the basis of relevant attributes. Neither the trainees nor the children were familiar with these creatures prior to the study. (See Appendices A and C for sample lessons and tests from each area.)

Observation Scales. The teaching behaviors that are often thought of as critical to the establishment of a successful teaching environment by the teacher fall into two broad categories: behavioral management strategies and cognitive level of questions initiated by the teacher.

Two observation instruments were used to record these process variables: the Indiana Behavior Management Scale-II (IBMS) was used to record a wide range of pupil behaviors that are off-task (i.e., not related to the learning task) and to record the teachers' responses to these behaviors. The IBMS, developed by Fink and Semmel (1971), categorizes pupils' behaviors into classifications such as types of verbal or physical manifestations of off-task behavior, self-involvement, and whether the behaviors are aggressive or interactive in nature. Teacher control responses are categorized into 11 classifications of control statements.

The data derived from the IBMS result in a profile of individual patterns of pupil off-task behavior, including percentage of off-task behavior in the total instructional period, frequency of off-task behaviors that occur during instruction, and frequency of types of control

measures invoked by teacher-trainees in response to pupil off-task behaviors.

In addition, the questioning strategies displayed by teacher-trainees were observed and coded in terms of the types of questions asked of pupils. The Individual Cognitive Demand Schedule (ICDS), developed by Lynch and Ames (1971), was used to record and describe classroom behavior in the cognitive domain. This system is based in part on the theory of cognition proposed by Gagne (1965). It is a hierarchical system that categorizes questions asked by teachers into various high and low levels. The low-level categories include simple verbal demands that require, for example, habitual responding, observing, recitation of previously-learned materials, and remembering. Higher-level categories include questions that require explaining, defining, classifying, applying and comparing, and inferential and problem-solving responses. Also included in the higher-level classifications are questions requiring value judgments and "make-believe" responses. The data derived from this system yield a profile of frequency and percentage of occurrence of any category over the entire instructional period (see Appendix B).

Procedure

The 12 trainees each conducted two 30-minute lessons, one from each content area.

Lesson Assignments. Each teacher-trainee received a lesson topic outline 24 hours before the scheduled teaching period. The outline included a listing of the purpose of lesson, suggested approaches,

and terminal goals. Teacher-trainees were encouraged to be creative in lesson planning.

Assignment of lesson topics was controlled so that each trainee taught both a music and concept-formation lesson, and order of content lesson and time of teaching were balanced across the study.

All lessons were taught between 3 and 5 p.m. For each class period, 6 children, from the overall group of 29, were reassigned to be pupils in one of the two classrooms.

Achievement tests. Most children served as classroom students six times and were taught three music and three concept-formation lessons. Occasionally, a child was used seven times and was taught all the lessons. Posttests were administered by two adults to the class as a whole directly after a trainee finished instructing the lesson. Posttest scores on each lesson resulted in an individual student percent-correct score on each lesson and a mean class percent-correct score for each trainee.

When more than six pupils were available to form classes for the music lessons, the extra students were given the test without being taught; they had a supervised play period instead of a lesson. This procedure resulted in an indication of prior knowledge of the pupils concerning these lessons. This procedure was not followed for the concept-formation lessons because the material was so unfamiliar to the pupils.

Analysis

The personnel inventory test scores of the 33 trainees were factor analyzed using the principal components method with a varimax rotation to reduce the test data to a smaller, more reliable set of scores. Factor scores were then computed for the 12 trainees who participated in the teaching phase of the study.

The children's tests were corrected, and each child was given a score consisting of the percent of questions he answered correctly. Two mean class percent-correct scores were computed for the music lesson.

The observation scale data were transformed to make them more reliable and more amenable to analysis. The IBMS categories were reduced to three scores: positive teacher behaviors (sum of ES, I, H, R, and PR categories), negative behaviors (sum of CD, PU, and QM categories), and neutral behaviors (sum of D, VL, CS, and QP categories) (see Appendix B for an explanation of these scales). Each trainee received the same total number of IBMS codes, since coding was done on a time basis. On the ICDS, however, a code was tallied whenever a questioning interaction occurred. This resulted in each trainee having a different total number of ICDS codes. To make the frequencies found in each category comparable for each subject, they were converted to percentages by dividing the raw frequency in each teacher category by the total number of teacher interactions and multiplying by 100; the raw frequency in each feedback category was converted by dividing by the total number of feedback interactions and multiplying by 100.

To determine if there were any differences between beginning and student teacher-trainees, one-way analyses of variance[3] were run using the following as dependent variables:

Biographical variables:

- age
- number of brothers
- number of sisters
- father's occupation
- father's education
- mother's occupation
- mother's education
- present education
- credit hours
- number of hours in elementary education
- number of hours in secondary education
- number of hours in special education
- attitudes toward teaching the following types of special children:[4]
  - epileptic
  - blind
  - mentally retarded
  - cerebral palsied
  - gifted
  - deaf
  - exceptional (in general)
  - delinquent
  - emotionally disturbed
- experience with retarded children
- grade point average

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[3]Stepwise multiple regression is the best technique to use with this data. It was tried but with no success. Because of the small sample size, the set of dependent variables had to be reduced before the regressions were run. Without an analysis of some sort, there was no logical way to accomplish this. Even when it was attempted, the resulting regression analysis was very unstable in that the error term would decrease at a rate that resulted in tremendously large F ratios. Since these analyses gave no more information than could be obtained by ANOVA techniques, they were dropped.

It would have been advantageous to use a higher order factorial design encompassing some of the subject variables as levels, but again because of small cell sizes, this was not feasible.

[4]Usually, these scores would have been included in the factor analysis. However, this information was available only for the 12 subjects who taught and so was considered separately.

Personnel inventory factor scores:

- percent of variance
- test and subscale
- Attitudes toward exceptional people
  - brain-injured person
  - EMR person
  - blind person
  - cerebral palsied person
  - gifted person
  - mongoloid person
  - crippled person
  - emotionally disturbed person
  - deaf person
  - trainable mentally retarded person
  - normal person
  - stuttering person
- Quick Word Test
- MR Content Exam
- California Test of Personality
  - self-reliance
  - sense of personal worth
  - sense of personal freedom
  - feeling of belonging
  - withdrawing tendencies
  - nervous symptoms
- personal adjustment
  - social standards
  - social skills
  - antisocial tendencies
  - family relations
  - occupation relations
  - community relations
- social adjustment
  - total adjustment
- Teacher Practices Questionnaire
  - advice-information giver
  - counselor
  - disciplinarian
  - referrer
  - motivator

Concept-formation lesson variables:

- mean class score
- IBMS scores
  - positive behaviors
  - negative behaviors
  - neutral behaviors
- ICDS scores
  - Total number of teacher interactions
  - % HR
  - % OD

% ST
% RE
% EX
% DS
% AC
% IN
% MB
% VJ
% PS
% GO
% CL
Total number of feedback interactions
% 0
% +
% -
% I
% +I
% -I
% Chorus

Music lesson variables:

mean class score
IBMS scores (same as above for concept-formation lesson variables)
ICDS scores (same as above for concept-formation lesson variables)

To determine if there were differences between trainees whose classes received high and low mean test scores, the trainees were regrouped into two groups two different ways: by mean class test score on the concept-formation lesson and by mean class test score on the music lesson. These splits were not necessarily made at the median score. Instead, the scores around the median were examined for the largest difference between two adjacent scores to make the splits as stable and as realistic as possible. One-way analyses of variance were run on each grouping using the dependent variables listed above.

A correlation matrix was computed to examine the relationships among several of the subject variables and dependent variables, including the mean class percent-correct test scores and the observation scale scores for both lessons. These were examined to determine if the trainees' questioning and management behaviors and teaching abilities were generalizable across the lessons.

Results

Factor Analysis of the Personnel Inventory

The personnel inventory scores of the 33 trainees were factor analyzed using the principal components method.[5] Varimax rotations were performed on 4, 5, and 6 factors. The 5-factor rotation resulted in the most interpretable factors. Table 2 displays these factors.

Factor I, attitudes toward socially unaccepted exceptional children, consisted mainly of subscales from the Connotative Reaction Inventory questionnaire which concerned exceptional children that could generally be classified as "socially unaccepted," e.g., educable mentally retarded, trainable mentally retarded, emotionally disturbed, and blind.

Factor II, external adjustment, consisted of subscales from the California Test of Personality (CTP) that concerned adjustment external to oneself, e.g., high scores on community relations, occupation relations, and social skills paired with a low score on personal adjustment, and subscales from the Teacher Practices Questionnaire that also emphasized external referrals, i.e., high score on referrer and low score on advice-information giver.

Factor III, internal adjustment, involved subscales from the CTP that emphasized internal, as opposed to external, adjustment, e.g., personal adjustment, family relations, and total social adjustment.

Factor IV, attitudes toward socially accepted exceptional children, contained subscales from the ATHC concerned with children usually con-

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[5]Since the purpose of this factor analysis was data reduction, the communalities were equated to 1 at the suggestion of Dr. Leroy Wolins, Department of Psychology and Statistics, Iowa State University, Ames, Iowa.

TABLE 2

Factor Loadings from Factor Analysis

of Basic Personnel Inventory Scores

Factor	1	2	3	4	5
Percent of Variance	23.5	21.0	15.7	9.1	5.9
Test and subscale					
Connotative Reaction Inventory					
1. Brain Injured Person	.857*	-.141	-.202	-.081	.248
2. EMR Person	.895*	-.064	-.120	-.209	-.008
3. Blind Person	.770*	-.034	.049	-.209	.167
4. Cerebral Palsied Person	.759*	.002	-.159	-.057	.055
5. Gifted Person	.453	.087	.022	-.751*	-.046
6. Mongoloid Person	.847*	-.001	-.301	-.269	-.029
7. Crippled Person	.830*	-.015	-.011	-.264	.199
8. Emotionally Disturbed Person	.816*	.024	-.038	-.037	.121
9. Deaf Person	.860*	-.084	-.143	-.133	.169
10. TMR Person	.851*	.068	-.236	.052	-.224
11. Normal Person	.331	.028	-.140	-.826*	-.088
12. Stuttering Person	.563	.034	-.163	-.623*	.193
13. Quick Word Test	-.201	.197	.112	.035	-.722*
14. MR Content Exam	-.463	-.138	.306	-.095	-.596*

27/28

Table 2 continued

California Test of Personality					
15. Self-reliance	-.060	-.123	.253	.728*	-.000
16. Sense of Personal Worth	-.230	.033	.707*	.152	.015
17. Sense of Personal Freedom	.466	.067	.288	.115	-.107
18. Feeling of Belonging	-.095	.082	.688*	.034	.219
19. Withdrawing Tendencies	-.045	.025	.821*	.163	-.125
20. Nervous Symptoms	.012	.100	.837*	.120	-.258
21. Personal Adjustment	-.030	.678*	.680*	.228	-.058
22. Social Standards	-.194	.586	.573	-.147	-.050
23. Social Skills	-.028	-.890*	.118	.196	.045
24. Antisocial Tendencies	.034	-.977*	-.071	-.027	.001
25. Family Relations	-.153	.012	.692*	-.176	-.338
26. Occupation Relations	-.106	-.748*	.283	-.048	.136
27. Community Relations	.055	-.981*	-.055	.007	.025
28. Social Adjustment	-.188	-.293	.857*	.035	-.025
29. Total Adjustment	.039	-.989*	-.023	-.002	-.015
Teacher Practices Questionnaire					
30. Advice-Information Giver	-.236	.691*	.407	-.310	.079
31. Counselor	-.203	.585	.161	-.276	.470
32. Disciplinarian	-.561	-.238	.214	-.067	-.546
33. Referrer	-.235	-.875*	-.128	-.086	-.115
34. Motivator	-.054	-.479	.256	-.486	.135

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sidered as acceptable by society, i.e., gifted, stutterers, and normal.

Factor V, mental ability, consisted of scores from the Quick Word Test and the Robinson and Robinson content examination.

Factor scores for the 12 trainees who participated in the teaching phase of this study were computed. They were used as dependent variables in the remainder of the study.

Analysis of Differences Between Teacher Trainees

To determine if there were differences between beginning (n = 6) and student teacher (n = 6) trainees, one-way analyses of variance were run over all of the dependent variables.[6] To determine if there were differences between trainees whose classes received high and low mean percent-correct test scores, the trainees were split into two groups two different ways: by mean class test score on the (a) concept-formation lesson and (b) music lesson. Table 3 indicates the grouping of the subjects for the concept-formation lesson analyses and the music lesson analyses.

Again, one-way analyses of variance were run over all variables for all groupings. Table 4 is a summary of all significant one-way analyses of variance and the corresponding means. Overall, very few variables were statistically significant between groups. Those that were significant were often significant across two of the three groupings: beginning

[6]Occasionally, a subject was missing certain dependent variables. This occurred once because of a computer malfunction which resulted in the loss of all ICDS scores for one subject teaching one lesson. Also, one subject did not teach a music lesson, and hence all of the data concerned with that lesson were lost. When these situations occurred, those subjects were eliminated from the analyses involving the missing dependent variables.

TABLE 3

Mean Percent Correct Class Scores and Rank of

Each Subject for High and Low Group Membership

Concept-formation lessons						Music lessons[1]					
	Low Group			High Group			Low Group			High Group	
S#	Mean Class Score (%)	Rank	S#	Mean Class Score (%)	Rank	S#	Mean Class Score (%)	Rank	S#	Mean Class Score (%)	Rank
5	42	12	9	57	5	8	21	11	9	46	6
1	48	10.5	3	60	4	4	25	10	3	47	5
4	48	10.5	8	61	3	5	33	8.5	10	50	4
6	50	9	10	66	1.5	7	33	8.5	6	57	3
12	51	8	11	66	1.5	12	41	7	1	58	2
7	52	7							11	67	1
13	54	6									
Median	50			61			33			53.5	
n	7			5			5			6	

	Concept-formation lessons	Music lessons
Mean	54.6	43.5
S.D.	7.2	13.8

[1] S13 was unable to teach a music lesson.

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TABLE 4

Summary Table of the Significant Effects

and Their Means Found Within Each Grouping

Dependent Variable	Beginning (B) Student Teacher (ST)	High (H) - Low (L) Concept-formation test score	High (H) - Low (L) Music Test Score
Biographical Data:			
Present Education 1=high school 2=college freshman 3=college sophomore 4=college junior 5=college senior 6 & above=graduate student	ST: 4.8 B: 3.3**		H: 3.7 L: 4.8
Credit Hours	ST: 114.7 B: 53.0**		H: 65.3 L: 113.4
Special Education Hours	ST: 36.7 B: 2.0**		H: 6.3 L: 38.2**
Attitudes toward teaching exceptional children:			
Teaching Epileptic 1=enjoy very much 2=might be interesting 3=don't care whether I do or not 4=wouldn't enjoy 5=do not want to	ST: 1.5 B: 3.0		
Teaching Gifted (as above)	ST: 1.2 B: 2.3		H: 2.2 L: 1.0*

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Table 4 continued

Basic Personnel battery factor scores:			
Mental Ability Factor (Factor V)	ST: 0.34 B: -0.28		H: -0.49 L: 0.51
Concept Formation Data:			
Mean % correct class score+		H: 62.0 L: 49.3**	
% + (ICDS)	ST: 71.4 B: 35.3**		H: 34.6 L: 71.4
% I (ICDS)	ST: 4.0 B: 12.3		H: 12.6 L: 4.0
% -I (ICDS)	ST: 0.6 B: 7.7	H: 8.5 L: 2.1	H: 7.6 L: 0.6
Music Data:			
Mean % correct class score•	ST: 33.8 B: 55.0*		H: 54.2 L: 30.6*
In (ICDS)			H: 3.8 L: 10.2

**indicates significance at the .001 level.
*indicates significance at the .01 level.
No asterisk indicates significance at the .05 level.

+A chance score on these tests is 30%.
•Some children were not taught the lesson but still completed the must posttest. Of the seven children involved, five had scores between 21% and 28%, one at 47%, and one at 73%.

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student teacher and high-low music score. From the biographical data sheet, information about education (present education, credit hours, and special education hours) and two items from the Connotative Reaction Inventory (epileptic and gifted) were often significant. The factor scores from the basic personnel inventory generally were not significant. The mean percent-correct class scores were significant for their respective groupings, as was to be expected. The music mean score also differentiated between beginning and student teacher-trainees with the mean for beginning trainees (55.0%) higher than that for student teacher-trainees (33.8%). The observation scale scores generally did not achieve significance; the major exception to this occurred for some of the feedback categories (+, I, and -I) on the ICDS for the concept-formation scores. IBMS scores never achieved significance.

Analysis of Generalizability of Scores Across Content Areas

To determine if teaching ability as measured by mean percent-correct class score was generalizable over the two different content areas, a rank-order correlation between rank on concept-formation lesson and rank on music lesson was calculated. The resulting value was not significant (r_s = .23, df = 9). The PPM correlation of .31 between the two sets of class scores also was not significant. These low correlations indicated that there was no justification for combining scores on the lessons and using the combined score as a new dependent variable.

The question of generalizability of teaching behavior was further examined by comparing the correlations between the observation scale

scores for each trainee on the two lessons taught. Table 5 contains these correlations. Since there were only 12, and, at times 11, trainees whose scores were correlated, the results must be interpreted with caution. There are, however, some trends in this table.

Several of the ICDS scales correlated above .50. This included the total numbers of teacher questioning and feedback interactions; for overall questioning and feedback interactions, the trainees were relatively consistent between the two lessons. Several other subscales, including % RE, % CL, % + and % I, also correlated at or above .50. The two sets of IBMS scores had low intercorrelations.

The lessons were compared for average difficulty. Table 6 presents the mean percent-correct and standard deviation of each of the seven lessons.

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[7]Table 5 was obtained from the larger table of correlations among several subject variables and dependent variables which is not included in this report.

TABLE 5

Correlations Between Scores on the Observation Scales

For the Concept Formation and Music Lessons

Observation Scale	Correlations
IBMS	
Positive Behaviors	-.24
Negative Behaviors	0.00
Neutral Behaviors	-.08
ICDS	
Total # Teacher Interactions	.57
%HR	.21
%OD	.29
%ST	-.39
%RE	.86
%EX	.31
%DC	.10
%AC	.21
%IN	-.12
%MB*	-
%VJ*	-
%PS*	-
%GO*	-
%CL*	.52
Total # Feedback Interactions	.61
%O	.20
%+	.50
%-	.40
%I	.71
%+I	-.19
%-I	-.12
%Chorus	-.32

*These four categories had nothing coded in them for at least one, and generally both, lessons.

TABLE 6

Means and Standard Deviations of the

Four Concept-Formation and Three Music Lessons

Lesson	Mean % correct	S. D.	Number of children who were taught this Lesson
Concept-Formation			
I	49.2	12.3	26
II	63.2	13.5	19
III	54.2	11.9	28
IV	56.4	11.1	12
Music			
I	31.5	20.5	24
II	55.2	21.3	18
III	46.9	20.0	24

Discussion and Conclusions

Several tentative conclusions can be drawn from this study. There were differences in teaching behaviors and in results between the beginning and student teacher-trainees in this study. The mean class percent-correct score on the music lessons was significantly higher for beginning than for student teacher-trainees: 55% as compared to 34%. It is interesting to note that this difference occurred even though the beginning-trainees scored significantly lower on the mental ability factor score. This score included results from a test designed to measure knowledge of mental retardation concepts.

The difference between beginning and student teacher-trainees on the concept-formation lessons was not significant. The means, however, were in the same direction: beginning trainees--50%, student teacher-trainees--51%. However, most of the variability in behaviors of the two groups as measured by ICDS scale occurred while they were teaching these lessons, not music lessons. During these lessons, beginning trainees gave more informational and negative feedback than did student teachers, while the latter gave more positive feedback than the former.

When splitting the trainees according to mean class percent-correct score, the high-low music split added almost no more information since almost all of the resulting high group were beginning trainees (5 / 6) and the resulting low group was student teacher-trainees (5 / 3). The high-low concept-formation split analyses indicated that there were almost no differences between those two groups of trainees.

Apparently, even when there were significant differences in mean class scores between two groups of trainees, there were no significant differences between them in teaching behaviors on those lessons as

measured by the IBMS and ICDS scales. When there were significant differences in the teaching behaviors for one set of lessons, there were no significant differences on test scores for that set of lessons. The explanation for this may be, at least in part, due to the two sets of lessons used.

The concept-formation lessons were chosen basically for their novelty. It was highly unlikely that either the trainees or the children would have seen the entities on which these lessons were based. This novelty was considered advantageous in that the results from these lessons would be free from previous experience with the materials. It may also have had the disadvantage of being so novel that the children had no basic cognitive structure to utilize in learning the new material. The mean class percent-correct scores only varied over 15 points (42% to 66%) with a standard deviation equal to half that associated with the music lessons. Also the two groups of trainees may have had to try different types of teaching behaviors in their attempts to teach the novel material. The beginning trainees, who had experienced little formal training in education, would rely on intuitive types of behaviors, such as large amounts of negative feedback when children responded incorrectly. The student teachers, however, had been educated to rely on positive, not negative, feedback, and thus employed it as a strategy. Neither type of behavior resulted in significant differences in learning for the children, although the mean scores for the groups of trainees were greater than chance. Perhaps in 30 minutes no teaching strategy could cope with the novelty of the task. It is also possible that the trainees had not clearly specified the relevant attributes of the lesson objectives in planning their lessons.

In addition to the variability between the two sets of lessons, the individual lessons within each set also were variable. The means on the music lessons varied from 32% to 55% correct; the means on the concept-formation lessons varied from 40% to 63%.

In spite of these sources of variability, some consistencies between the two lessons taught by each trainee were found. The correlation between mean percent-correct class scores was not significant but was positive. The correlations between scales on the ICDS indicated that there were reasonable-sized correlations (i.e., greater than .50), between the two lessons for total number of teacher questioning interactions and feedback interactions, as well as for other subscales.

General conclusions can be drawn from the procedures and results of this study:

First, the method developed for a performance test of teaching is feasible; the pilot has shown that it is possible to arrange for children, trainees, coders, and experimenters to be in the same place at the same time ready to set up a teaching laboratory.

Second, this pilot indicates at least some generalizability of teaching ability across different content areas.

Third, there were differences between the beginning and student teacher-trainees who participated in this study. Although these differences were not totally interpretable, the two groups tended to engage in different amounts of various types of teaching behavior, and their classes learned different amounts of material.

Fourth, almost no stable relationships between trainee characteristics and teaching ability were found.

Fifth, although there were nc completely consistent relationships between pupil learning and process variables used in teaching, the group that obtained the higher pupil achievement scores (beginning teacher trainees) tended to use more informational and negative feedback and less positive feedback techniques while teaching than did the group that obtained lower scores (student teacher-trainees).

As with most pilot projects, the feasibility of the proposed method and tentative probing of the objectives were the immediate goals. The results suggested the feasibility of the method, but they did not meet anticipations concerning the objectives.

The analysis of teacher behavior quite naturally involves the identification of numerous variables. Through a review of the research literature on teacher characteristics and behaviors, the experimenters attempted to identify the variables that are most likely to relate to pupil achievement and hence can predict teaching ability as defined in that manner. In retrospect, an important area of teacher behavior that was not objectively examined in the original identification of pertinent teacher variables was that of motivation to teach. This variable was uncontrolled in the present study.

It was assumed that since all trainee subjects were volunteers this voluntary participation indicated a strong motivation to teach. There are two areas of evidence that indicate this assumption was incorrect. First, the two sets of trainees, beginning and student teacher, were not equally willing to volunteer for the study as Table 1 clearly indicates. For the beginning group, two-thirds of those contacted agreed to take the Personnel Inventory and all of those six subsequently contacted for actual teaching participation agreed. For the student teacher group, about one-

fourth of those actually volunteered to continue the study; two more were eventually convinced. The beginning group was much more willing to participate than the student teacher group.

Second, only two of the 12 trainees brought their own materials into the classroom. The rest depended entirely on materials supplied to them by the staff. It is possible that this lack of preparation of materials to use in teaching was an indication of the low level of motivation to teach, especially by the student teaching group members who have been educated in the preparation and importance of materials for use in teaching EMR children.

This motivational variable may account for at least some of the trends in the data. It is apparent that this aspect of teacher behavior must be accounted for and controlled, if possible, in future similar research.

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Recommendations

A full-scale replicate of this study is needed. New lessons should be developed and thoroughly tested before being used. A large group of EMR children should be available so that each child would be involved in any class only twice: once for each of the two general content areas. This would necessitate one lesson per area and would eliminate the problem of comparability of lessons within a content area. A larger number of beginning and student teacher-trainees (at least 20 per level) should be utilized as subjects; these subjects could then be followed longitudinally through school and out into the field. The trainees' motivation to teach should be examined. The tests in the basic personnel inventory should be reexamined and altered to result in a better battery. The observation scales should either be modified or replaced with new ones.

This replication should indicate whether the method is sensitive enough to detect and help explain the differences in teaching styles and results that the pilot indicated exist between teachers.

APPENDIX A

Sample Concept-formation Lessons

Instructions to Teachers, and Criterion Tests

INSTRUCTIONS TO THE TEACHER

Your task will be to teach superordinate concepts about a class of MONZERS with certain physical characteristics and two subordinate concepts within this concept.

In case you are worried about the terms about concepts, here are some examples:

LIVING THINGS is a superordinate concept.

MAMMALS and REPTILES are subordinate concepts within the concept of LIVING THINGS.

In case you are wondering what a MONZER is, it is an imaginary creature found in the two-dimensional world called the FLATWELT. You will be given a set of pictures of these MONZERS to give you an idea of what they look like generally. Here are some things to remember about these pictures:

1. They are all drawn to actual life size.
2. All MONZERS are flat creatures.
3. MONZERS don't have any colors--not even shades of gray. They have just black and white parts.
4. The pictures show the MONZERS in their naked state. All characteristics are physiological. The stripes and spots are on their bodies.
5. Do not confuse temporary gestures (grinning mouth, bent legs, clenched fist) with permanent characteristics of the MONZER anatomy.

Your job, as we said before, will be to teach the types of MONZERS defined on the next page. At the end of your teaching session, which will last for _____ minutes, your pupils will be tested on the following objectives.

1. To identify examples which they were presented during instruction and new examples.
2. To discriminate close-in nonexamples.
3. To give a definition (in their own words) of the concept classes.
4. To check critical characteristics of the MONZERS belonging to the given classifications from a list.
5. To recall the name of the given concept classes of MONZERS.
6. To draw a MONZER of a given class.

REMEMBER: Any physical attribute not specifically mentioned in the definition of the concept classes may vary in the pictures used as test items. To get an idea of how widely these noncritical aspects vary, study the MONZER cards.

SUPPLIES: You will be given a deck of MONZER pictures. You may use them in any way during the lesson. You may also provide any other material or equipment usually found in a classroom (e.g., chalk, construction paper, etc.). You may develop your own instructional materials for use during the lessons.

MONZER SET I (TEL)

TEL: Any MONZER with a plain (i.e., not spotted) body and without a neck.

NANTEL: A TEL which has no arms.

(e.g., 3, 22, 28, 41 and 43)

TELRAM: A TEL which has two or more arms.

(e.g., 5, 8, 16, 47 and 52)

The numbers in parentheses after each definition are the numbers of cards which contain examples of that type of MONZERS.

REMEMBER: Any physical characteristic not specifically mentioned in the definition may vary widely within the class of MONZERS. For example,

A TEL may have any type of nose.

To get an idea of how widely these noncritical aspects may vary, study your MONZER cards. Your pupils may be confronted with new types of examples in the test.

INSTRUCTIONS FOR ADMINISTRATION OF CRITERION TEST: MONZER SET I (TEL)

1. "Turn to page one." (Hold up sample).

   "Look at the monzers, find the ones that are TELS."

   "Draw a line across all the TELS you can find."

2. "Turn to the next page. (Hold up sample). Page 2."

   "Put a red line on each Ramtel you find."

   "Put a blue line on each Nantel you find."

3. "Turn to the next page, page 3."

   "There are nine questions, look at them as I read them to you.

   Number 1. Monzers are silly looking. If the answer is yes, put a line through the smiling face. If you don't think monzers are silly, put a line through the frown.

   Number 2. All Tels have spots on their bodies. Put a line through the smile if yes. Put a line through the frown if no.

   Number 3. A Tel has a neck.
   smile-yes frown-no

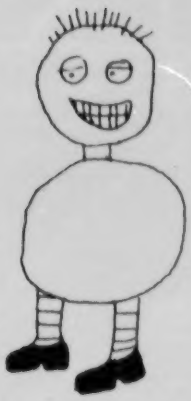
   Number 4, 5, 6, 7, 8, (Read questions).

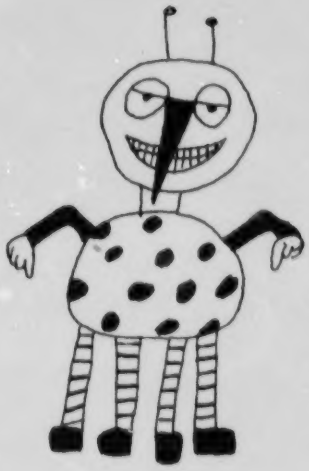
4. "Listen carefully to number 9;" (Read number 9).

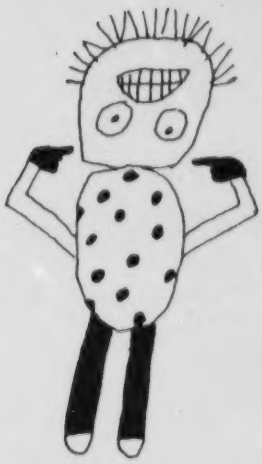
   "Write the name of the Monzer."

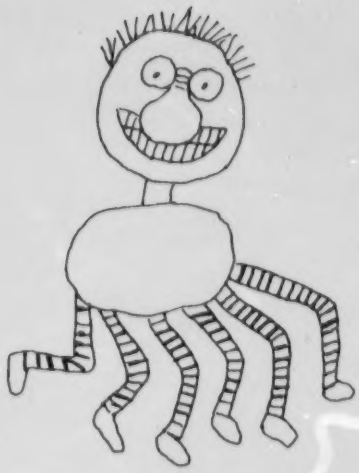
5. Turn to page four. "Draw a picture of a Ramtel. It may be one you remember from the lesson, or a new one."

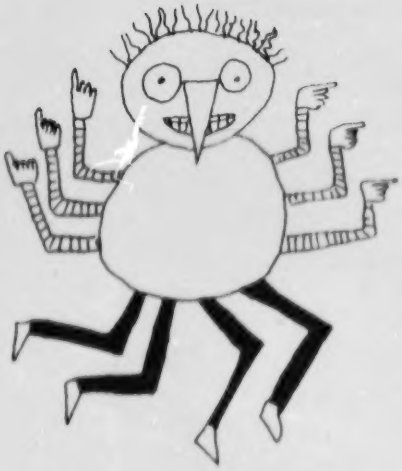
1

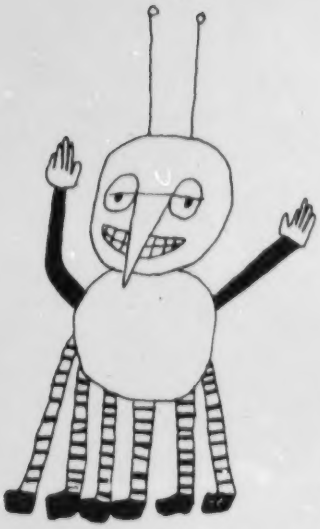




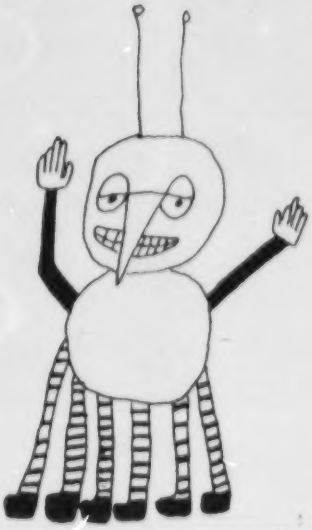








3



4

a. Fish fly in the sky. YES No

1. All TEL's have plain bodies. YES No

2. All TEL's have necks. YES No

3. A NANTEL has two arms. YES No

4. A TEL has a neck and no body. YES No

5. A TELRAM has two or more arms. YES No

6. A TEL has no neck. YES No

7. A NANTEL has two or more arms. YES No

8. A TELRAM can have 6 arms. YES No

9. What is the name of the TEL that has no arms ?

10. What is the name of the monzer with a plain body and no neck ?

11. What is the name of the TEL with two or more arms ?

6

Draw a picture of a TELRAM.

APPENDIX B

Explanation of Observation Instrument Scales (IBMS and ICDS)

IBMS II ABRIDGED CODER'S MANUAL

PUPIL CATEGORIES

Task Behavior

1. task (t) "I'm doing what I'm supposed to."	Pupil's head and eyes are oriented towards persons or objects related to the lesson or lesson instructions. "Lesson" is defined by the teacher.

Off-Task Behavior

1. self-involvement (si) "I'm minding my own business."	Student is "alone" and quiet, (e.g., staring, daydreaming, playing with self or other objects, muttering to self, wandering around by himself, sleeping). No verbal or phyical interaction with others.
2. noise (n) "I'm making a disturbance by myself."	Verbal and physical behavior which is non-communicative and disruptive, e.g., slamming a desk, tapping feet, whistling, clapping, singing, etc., when NOT an integral part of task.
3. verbal interaction (vi) "I'm talking to someone else, but I'm not angry."	Talking when not supposed to, e.g., interrupting teacher or another student when inappropriate. Not agressive.

4. physical interaction (pi) "I'm playing with someone else but I'm not angry."	Non-verbal interactions that are not aggressive: playing a game, passing notes, touching someone else. Rule: All physical interactions take precedence over verbal. That is, if pi occurs simultaneously with vi, code pi.
5. verbal aggression (va) "I'm angry and I'm telling you about it."	Insulting, abusive, angry statements directed to peers and/or teacher. Rule: Code va over vi.
6. physical aggression (pa) "I'm angry and I'm showing you how angry I am."	Physical attack: punching, hitting, spitting, throwing something at someone--directed to peers and/or teacher. Rule: Code pa over pi. Code pa over va.
7. verbal resistance (vr) "I won't."	Verbal refusal to CARRY OUT TEACHER DIRECTIONS--either to do a particular task or to stop misbehaving. This ONLY occurs during an interaction with the teacher. Rule: Code vr over va.

8. physical resistance (pr) "I won't and I'm showing you."	Physical refusal to cooperate with teacher directions. May include verbal and aggressive responses. Continues misbehavior, sits silently, refuses to follow directions, uses physical force to resist teacher. This ONLY occurs during an interaction with teacher. Rule: Code pr when both pr and vr occur at the same time.

TEACHER CATEGORIES

Task behavior

1. Task (T) "I'm marching to the beat of my own drum." -or- ("I'm doin' my own thing.")	Any teacher behavior related to lesson, whether social or academic. In general, this includes all teacher behavior which has <u>not</u> been initiated by a pupil off-task behavior.

Teacher Control Behavior is <u>always</u> initiated by a pupil's off-task behavior. The teacher responds in one of the following control categories:

1. Demand (D) "I want you to _____" (stop doing what you're doing.)	Direct verbal commands to "cease and desist" in firm, authoritative tone. No pupil response expected, e.g., "Be quiet!"
2. Value Law (VL) "We must. . . ."	Teacher <u>explicitly</u> reminds pupil of the established rules of behavior in the classroom by describing or referring to a <u>norm</u> of behavior. E.g., "You know we raise our hands when we wish to speak."

3. Conditional Stimulus (CS) "Hey you!"	A "signal" for the pupil to stop misbehaving; short phrases and gestures like, "OK," calling the pupil's name, "Sh!," pauses, stares. Rule: CS frequently accompanies another control behavior; code the <u>other</u> control behavior when that happens.
4. Criticism-Demeaning (C-D) "You are a . . ."	Psychological degradation of pupil with verbal attack, criticism, or sarcasm, e.g., "I suppose you think you're being clever?"
5. Punishment (Pu) "Because you were off-task, this is happening to you."	A direct, verbal or physical application of negative sanctions, including loss of privileges and restrictions on pupil freedoms.
6. Empathy-Sympathetic (E-S) "I understand . . ."	Teacher expression of his understanding of the pupil's feelings. Rule: If the teacher appears to be empathic-sympathetic at the same time he is using another type of control behavior, code the <u>other</u> control behavior.

7. Interpretive (I) "The reason you've been misbehaving is _____..."	Teacher statements which explain the reason for a pupil's misbehavior, e.g., "You're not paying attention because you don't get enough sleep at night."
8. Humor (H) "_____ is a diddledee."	Teacher efforts to reduce tension and control pupil behavior by means of jokes, clowning, asides, etc. No intent to criticize pupil.
9. Consequences (Q+) (Q-) "If you _____ (behave this way), then _____ (this will happen)."	Verbal statements stating or implying consequences to behavior. Incentives, rewards, or promises are positive consequences (Q+); threats are negative consequences (Q-).
10. Redirection (R) "I'm moving you to a task."	Teacher subtle use of "task" to control misbehavior; a positive refocus of attention without reference to the misbehavior. Verbal or physical, but not punitive e.g., "Will you read the next paragraph, John?" "Will you and George change seats for today?"

11.	Probing (Pr) "Why are you _____ (off-task)?"	Teacher questions to find out (or get the pupil to think about) the reason for his misbehavior. The teacher expects the pupil to answer.

GENERAL CODING RULES:

1. If the teacher is silent during an interaction with a pupil, continue coding whatever behavior the teacher was previously engaged in.

2. Following a teacher Redirection (R), as soon as the pupil appropriately responds to the teacher's redirecting statement or question, then you code both the pupil and the teacher as on-task. (This is the only exception to Rule #1.)

SUMMARY OF TEACHER AND PUPIL CATEGORIES: Low-level cognitive demands:

1. Habitual Responding (HR) - "Repeat after me."

   An activity that requires a simple, habitual, almost automatic response. This response requires little or no thinking or memory.

. . . . . .

2. Observing-Discriminating (OD) - "Say what you see."

   The child is required to notice, identify, and/or describe things which are in front of him (no memory is involved.) The child just reports what he observes without having to transform the information in any way.

. . . . . .

3. Stringing (St) - "Read the first paragraph."

   The child is required to make already-learned responses which form a natural sequence. Each part of the response suggests the next one to come so that the child is able to string the response without much thought. E.g., spelling, counting, reciting by rote, singing.

. . . . . .

4. Remembering (Re) - "Remember what happened in the story."

   The child is required to remember and tell something he has experienced himself or through reading. The response does not require any transformation of information - just direct recall.

. . . . . .

SUMMARY OF TEACHER AND PUPIL CATEGORIES: High level demands:

5. Explaining (Ex) - "How? Why?"

The child is required to pull together information and rules and explain the cause of an event. The rules used in the response are those which the child already knows and understands. He is not required to construct rules or to interpret them.

. . . . . .

6. Defining-Classifying (DC) - "What is a wambat?"

The child is required to demonstrate his understanding of a concept by supplying the correct meaning of a term or by giving the correct label for a set of examples. The response may involve grouping of various objects, matching examples with different labels, giving examples of different concepts, etc.

. . . . . .

7. Applying-Comparing (AC) - "What's the difference?"

The child is required to compare and/or contrast concepts and to formulate generalizations. Note: When the teacher requires a comparison of specific, concrete objects that are in front of the child it is an OD.

. . . . . .

8. Inferring (In) - "Did the butler do it?"

The child is required to arrive at his own conclusions, deductions, hypotheses, or interpretation from available information. The response should involve some new discovery by the child, rather than a relation of previously learned facts (Ex).

. . . . . .

9. Making Believe (MB) - "Let's pretend."

The child is required to elaborate freely on an idea without any constraints. The response should involve free associations and personal and original outcomes.

. . . . . .

10. Value-Judging (VJ) - "Do you think that's a nice thing to do?"

The child is required to judge the goodness, (worth, suitability, etc.) of something or to express how he feels about something. The response involves making comparisons with an explicit standard or an implicit one as in the case of giving an opinion. Requiring the child to justify his judgment also belongs to this category.

SUMMARY OF TEACHER AND PUPIL CATEGORIES: High level demands:

11. Problem Solving (PS) - "How would you fix that?"

The child is confronted with a puzzling situation and is required to analyze the situation and come up with a solution.

. . . . . .

ADDITIONAL COGNITIVE DEMANDS:

Going Over (GO) - "What did you get for Number Three?"

The child is required to present a completed assignment (or parts of it) to the class or to the teacher. This includes all tasks which the child has completed at some previous time. The original task may belong to any category of cognitive demand, but the report on the task is always coded as GO. When the student is asked to read his answer, it is coded as GO rather than St.

Clarification (Cl) - "I didn't catch that one?"

Before a teacher can make a Cl demand, the child should have responded to a previous demand. The teacher then asks the child to repeat, rephrase, or revise his previous response. Note: Clarification should not be confused with subsequent questions which require the child to give additional information, or expand on or explain his response. If the question belongs to any other category of cognitive demands, it does not belong to Cl.

TEACHER FEEDBACK:

No Feedback (0): The teacher does not respond to the pupil response--i.e., he goes on without any specific comment about the pupil's response.

Positive Feedback (4): The teacher "accepts" the pupil response. She can indicate that the response is correct (e.g., "Right," "Exactly," "Correct," "Yes"), or she may praise the child (e.g., "Good," "Fine," "Excellent," "Beautiful!", "That was a brilliant answer") or she may repeat the child's response (e.g., "So you think that ....")

Negative Feedback (-): The teacher does not "accept" the pupil response. She may scold the pupil for not giving an acceptable response or she may criticize the child's response (e.g., "That was a dumb answer," "You haven't been paying attention," "How could you know when you aren't looking at the board") or she may indicate that the response is incorrect (e.g., "No," "Wrong," "That's not right," "Not really," etc.)

Informational Feedback (I): The teacher provides cues and additional information to aid the child in responding. He may direct the child's attention to some item of information, or hint at the correct answer. Sometimes he may even give the correct answer. He may explain why a response is correct or incorrect. He may add information to the response and clarify it or he may ask the child to elaborate on his previous response.
E.G., "I am waiting for you to say '36'."
"It won't work because it will be top heavy. Try again."
"But look again at the picture."
"OK. That's an idea. Tell us what you based your idea on."
"Yes, and it was green, too."

GENERAL RULES OF CODING

1. Non-cognitive demands: Do not code procedural demands (e.g.; "Mary did you bring your milk money today?" or classroom-management demands (e.g., "Be quiet Mark and listen to me.")

2. Pupil chorus responses: Do not code cognitive demands which elicit two or more pupil responses occurring simultaneously (chorus response). Also do not code the pupil chorus response. Only when the teacher cognitive demand elicits one pupil response (at a time) do you code the teacher and the pupil.

3. Series of teacher questions or rhetorical questions: Code only when the teacher pauses to give room for an individual pupil's response. If the teacher asks a series of questions, and then pauses to allow a pupil to respond, code the last question only.

4. More-than-one-level demand: When two levels of cognitive demands are suggested by a given teacher question and you cannot eliminate one of them, then code the lower-level demand only.

5. Coding mistakes: Do not try to change a previous coding once it is down on paper. Even if you decide that it should be a different category, leave your original code.

CODING PUPIL RESPONSES

1. We are not interested in whether the pupil's response is correct or incorrect. Code the category of his response without worrying about its correctness.

2. If the pupil does not respond to a teacher cognitive demand, leave the pupil code space blank. (e.g.; pupil remains silent, shrugs shoulders, says "I donno.")

3. The pupil response space is also left blank if the response is completely "irrelevant" or "inappropriate" to the ongoing lesson.

4. Sometimes a child may initiate a cognitive demand by asking the teacher a question or by volunteering some information during the lesson. If the pupil response is appropriate or relevant to the lesson and if the teacher recognizes it, then code the pupil response and the teacher's feedback, if any. Then go to the next interchange box on your coding sheet.

TEACHER FEEDBACK

1. Never use more than one category at a time for coding the feedback.

2. Informational feedback (I) takes priority over other categories. If the feedback is both positive (or negative) and informational

at the same time, code it I (for informational).

3. When the feedback is both positive and negative, code it as negative (-).

4. When no feedback is given, code it 0.

APPENDIX C

Sample Musical Notation Lessons and Criterion Tests

Lesson Topic I. Introduction to Written Music.

Purpose:

1. To gain rudimentary understanding of basic musical notation.
2. To recognize a five-line musical staff.
3. To know that each written note corresponds to a sound.
4. To know that ascending notes on staff correspond to higher notes.
5. To know that descending notes on staff correspond to lower notes.
6. To teach pupils to recognize and write the ascending notes; middle c, d, and e.

Various Approaches:

1. Xylophone. (An eight note set will be available in room.)
2. Model staff.
3. Finding notes on xylophone.
4. High/low sound games.
5. High/low written notes (game).
6. Playing tune or combination of sounds of c, d, and e on xylophone and writing them down.
7. Your imagination.

Time - 30 minutes. Children will be tested following lesson on the following objectives:

1. To give definition (in own words) of staff, note.
2. To identify the high-low relationship between notes (both auditory and notational).
3. To identify and write notes c (middle), e, and d on a staff.

DIRECTIONS FOR ADMINISTRATION OF CRITERION TEST: Musical Notation
(Lesson #1)

1. Distribute booklets (each child's name will be on a testbook) and pencils.

2. When all are at attention read the following:
"Look at the booklet on your desk. I will read each question to you. Listen carefully and then answer it on your paper."

"Everybody look at number one (hold up book and point). Listen."

(Read #1) "Fill in the answer."
(Read #2) "Fill in the answer."

3. Get bells--(Read #3) play an [a] and [c] (high).
"Put a line across the one of the highest was first, put a line across the two if the highest was second."

"Listen again to #3." (Play [a] and [c]).

4. Now look at #4.

(Read #4.) Play a [b] and [f] (low).

5. (Read #5). Play C, F, D.

6. (Read #6). Play E, G, B.

Turn to Page 2. (Show #2). Make sure all are on the right page.

7-10. Read.

Turn to page 3. Make sure all are on the right page.

11-14. Read.

Turn to page 4. Make sure all are on the right page.

15-18. Read.

Turn to page 5. Make sure all are on the right page.

19-20. Read.

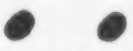
1

MUSICAL NOTATION (LESSON I) CRITERION TEST

1. A musical staff is made up of _____ lines.

2. A circle placed on a line of a musical staff is called a _____.

3. Listen to these two notes; which is higher?

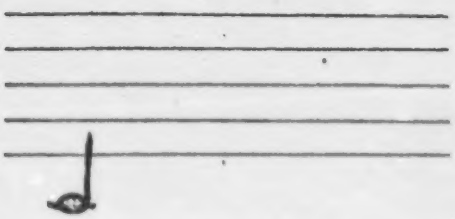


4. Listen to these two notes; which is higher.

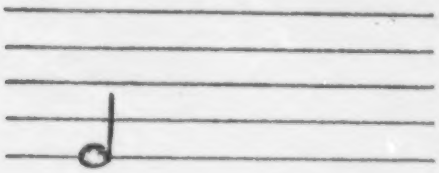
5. Listen to these 3 notes. Write down which was the highest note, the first, second or third.

6. Listen to these 3 notes. Write down which was the lowest note, the first, second or third.

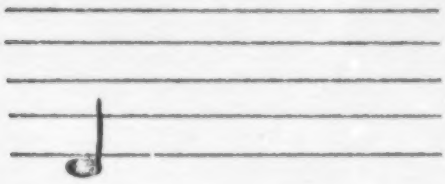
7. Look at the staff, write the name of the note you see there.



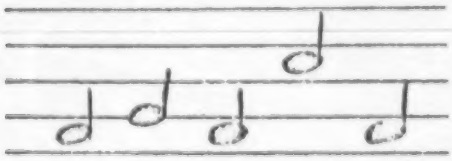
8. Look at the staff, write the name of the note you see there.



9. Look at the staff, write the name of the note you see there.

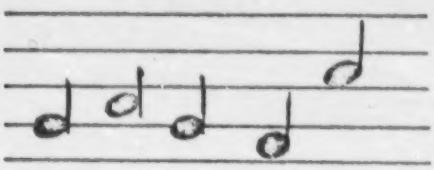


10. Which note is highest? Put an x on the highest note.

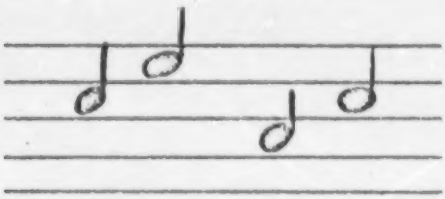


x.

11. Which note is highest? Put an x on the highest note.



12. Which note is lowest? Put an x on the lowest note.



13. Draw a middle "C".

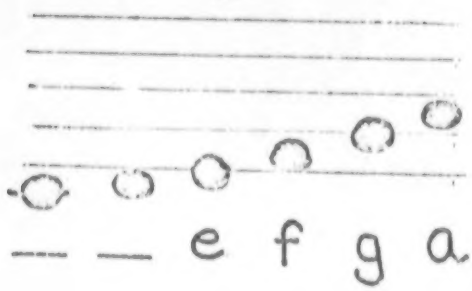
14. Draw a "d" note.

15. Draw a "e" note.

16. Draw a d, middle c, and an e on the staff.

17. Fill in the letter.

18. Fill in the letters.



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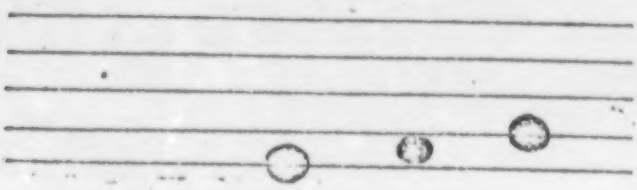
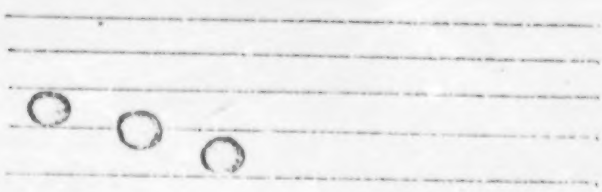
19. Fill in the notes.

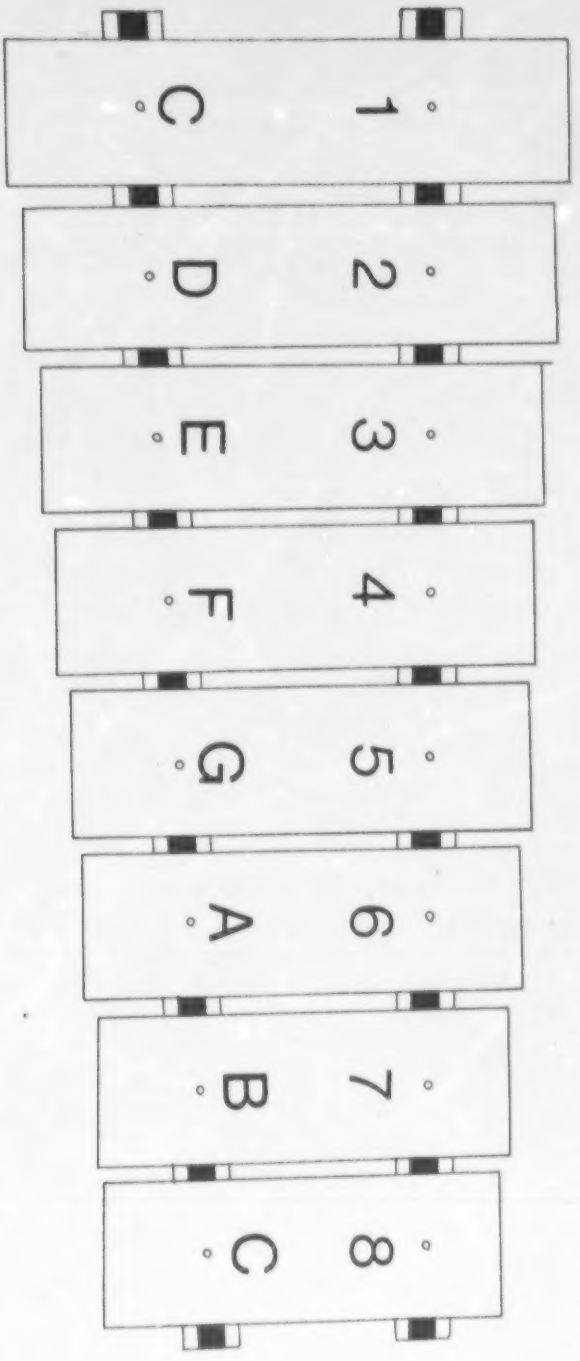


c d e f g

20. Fill in the notes.



a g f e d c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